Relevant Costs for Managerial Decisions

Chapter 25

Wild and Shaw

Fundamental Accounting Principles

25th Edition

Copyright ©2021 McGraw-Hill Education. All rights reserved. No reproduction or distribution without the prior written consent of McGraw-Hill Education.

Chapter 25 Learning Objectives

CONCEPTUAL

C1 Describe the use of relevant costs and benefits for short-term decisions.

ANALYTICAL

A1 Determine price of services using time and materials pricing.

PROCEDURAL

P1 Evaluate make or buy decisions.

P2 Evaluate sell or process decisions.

P3 Determine sales mix with constrained resources.

P4 Evaluate segment elimination decisions.

P5 Evaluate keep or replace decisions.

P6 Determine product selling price.

P7 Evaluate special offer decisions.

© McGraw-Hill Education

Learning Objective C1

Describe the use of relevant costs and benefits for short-term decisions.

© McGraw-Hill Education

Decision Making

Decision making has five steps:

Exhibit 25.1

Learning Objective C1: Describe the use of relevant costs and benefits for short-term decisions.

© McGraw-Hill Education

Access the text alternative for slide images.

Relevant Costs and Benefits

- **Incremental revenues**: additional revenues generated by selecting one action over another.
- **Incremental costs:** additional costs incurred if a company pursues a certain course of action.
- **Incremental income:** incremental revenues minus incremental costs.
- **Rule:** choose alternative that most increases income.

Learning Objective C1: Describe the use of relevant costs and benefits for short-term decisions.

© McGraw-Hill Education

Relevant vs. Irrelevant Costs

Sunk cost arises from a past decision and cannot be avoided or changed. Sunk costs are irrelevant to current and future decisions.

Out-of-pocket cost requires a future outlay of cash. Out-of-pocket costs are

Opportunity cost is the potential benefit lost by taking an action over an alternative action. Opportunity costs are relevant.

Avoidable cost can be eliminated by choosing one alternative versus another. Avoidable costs are relevant.

Learning Objective C1: Describe the use of relevant costs and benefits for short-term decisions.

© McGraw-Hill Education

Access the text alternative for slide images.

Learning Objective P1

Evaluate make or buy decisions.

© McGraw-Hill Education

Make or Buy Analysis

- FasTrac currently buys a key part for $1.20 per unit.
- Cost to make is $1.05 and includes direct m… …ental ov…

Exhibit 25.2

Make or Buy Analysis	Make	Buy
Direct materials	$0.35	–
Direct labor	0.50	–
Overhead (incremental only)	0.20	–
Cost to buy	—	$1.20
Cost per unit	$1.05	$1.20
Decision: Cost savings to Make		**$0.15**

Decision rule: Make the part to save $0.15 per unit.

© McGraw-Hill E…

Learning Objective P2

Evaluate sell or process decisions.

© McGraw-Hill Education

Sell or Process

- Companies must decide whether to sell partially completed products as is or to process them as other products.
- Decision depends on the costs and revenues of processing further.
- Company will select the action with the higher income.

Learning Objective P2: Evaluate sell or process decisions.

© McGraw-Hill Education

Sell or Process Analysis

Exhibit 25.3

Sell or Process Analysis	Sell As Is	Process Further
Revenue	$50,000	$150,000
Cost	–	80,000
Income	$50,000	$ 70,000

The $30,000 of previously incurred costs are excluded from the analysis. These costs are *sunk costs* and are not relevant!

Decision rule: Select the alternative with the higher income. Company should process further to earn $20,000 of incremental income ($70,000 – $50,000).

Learning Objective P2: Evaluate sell or process decisions.

© McGraw-Hill Education

Scrap or Rework

Variation of sell or process is scrap or rework.

Often in manufacturing, we have products that do not pass inspection and are therefore, defective. We can either scrap them or rework them.

Decision rule: selection option with highest income.

Scrap or Rework Analysis	Scrap	Rework
Revenue from scrapped/reworked units	$ 4,000	$15,000
Cost of reworked units		8,000
Income	$4,000	$ 7,000
Decision: Incremental income to Rework		**$3,000**

Exhibit 25.4

Learning Objective P3

Determine sales mix with constrained resources.

© McGraw-Hill Education

Sales Mix When Resources Constrained

- **When a company sells a variety of products, some are likely to be more profitable than others.**
- **Management looks for most profitable sales mix of products.**
- **If production facilities are limited, producing more of one product usually means producing less of others.**
- **In this case, management must identify the most profitable combination, or *sales mix of products.***
- **Management focuses on the *contribution margin per unit of scarce resource*.**

Learning Objective P3 Determine sales mix with constrained resources.

© McGraw-Hill Education

Sales Mix When Resources are Constrained – Illustration

Company makes and sells two models of scooters, using the same machines.

Pro uses one machine hour per unit; Max uses two machine hours per unit.

We [illegible] ***in***

Product Contribution Margin	Pro	Max
Selling price per unit	$500	$750
Variable costs per unit	350	550
Contribution margin per unit	$150	$200
Machine hours per unit	1 hr	2 hr
Contribution margin per machine hour	**$150**	$100
	($150/1	($200/2

Exhibit 25.5

Decision rule: Produce the model that yields the highest contribution margin per machine hour until market demand is satisfied.

Pro model has a higher **contribution margin of $150 per machine hour**. The company should produce as many units of Pro as possible, up to market demand.

© McGraw-Hill Education

Sales Mix When Resources are Constrained and Unlimited Demand - Illustration

Company makes and sells two models of scooters, using the same machines.

Pro uses one machine hour per unit; Max uses two machine hours per unit.

We need to determine each product's ***contribution margi***

Exhibit 25.6

Sales Mix with Unlimited Demand	Contribution Margin	Machine Hours Used
Pro (2,000 units × $150 per unit)	$300,000	2,000
Max (0 units)	0	0
Total	$300,000	2,000

Decision rule: If demand for products is unlimited, devote all machine hours to production of the most profitable product (per unit of scarce resource).

Learning Objective P3: Determine sales mix with constrained resources.

© McGraw-Hill Education

Sales Mix When Resources are Constrained and Limited Demand - Illustration

Company makes and sells two models of scooters, using the same machines.

Pro uses one machine hour per unit; Max uses two machine hours per unit.

We need to determine each product's ***contribution margi***

Exhibit 25.7

Sales Mix with Limited Demand	Contribution Margin	Machine Hours Used
Pro (1,200 units × $150 per unit)	$180,000	1,200
Max (400 units × $100 per unit)	40,000	800
Total	$220,000	2,000

Decision rule: If demand for products is limited, produce the most profitable product (per unit of scarce resource) up to point of total demand. Use remaining capacity to produce the next most profitable product.

Learning Objective P3: Determine sales mix with constrained resources.

© McGraw-Hill Education

Learning Objective P4

Evaluate segment elimination decisions.

© McGraw-Hill Education

Segment Elimination

- A segment is a candidate for elimination if its contribution margin is less than its **avoidable** fixed costs.
- **Avoidable** costs are amounts that are eliminated when the segment is eliminated.
- **Unavoidable** costs are amounts that would remain even if the segment was eliminated.

Learning Objective P4: Evaluate segment elimination decisions.

© McGraw-Hill Education

Segment Income

Exhibit 25.8

Segment Income before Segment Elimination				
	Treadmill	Wellness	Fitness	Total
Sales	$ 40,000	$200,000	$100,000	$340,000
Variable costs	35,000	110,000	55,000	200,000
Contribution margin	5,000	90,000	45,000	140,000
Fixed costs	15,000	20,000	10,000	45,000
Income (loss)	$(10,000)	$ 70,000	$ 35,000	$ 95,000

Decision Rule: A segment should be eliminated if income increases from elimination. It should continue if income decreases from elimination.

Learning Objective P4: Evaluate segment elimination decisions.

© McGraw-Hill Education

Access the text alternative for slide images.

Segment Elimination Analysis

Segment Income after Segment Elimination	Wellness	Fitness	Total
Sales	$200,000	$100,000	$300,000
Variable costs	110,000	55,000	165,000
Contribution margin	90,000	45,000	135,000
Fixed costs	**28,000**	**13,000**	41,000
Income (loss)	$ 62,000	$ 32,000	**$ 94,000**

Exhibits 25.9 & 25.10

Segment Elimination Analysis	Continue	Eliminate	Income Increase (Decrease)
Sales	$40,000	$0	
Variable costs	35,000	0	
Contribution margin	5,000	0	
Fixed costs	15,000	11,000	
Income (loss)	$(10,000)	$(11,000)	$(1,000)

Access the text alternative for slide images.

Learning Objective P5

Evaluate keep or replace decisions.

© McGraw-Hill Education

Keep or Replace

- **Managers must periodically decide whether to keep using a plant asset or replace it.**
- **Compare revenues and costs of keeping the old asset versus**

Decision rule: Replace an asset if overall income increases. Keep the asset if overall income decreases with replacement.

Learning Objective P5: Evaluate keep or replace decisions.

© McGraw-Hill Education

Keep or Replace Analysis

FasTrac is considering replacing an existing machine with a new machine.

Existing Machine	
Book value	$20,000
Variable manufacturing costs per year	$50,000
Salvage value	$ 0
Selling price currently	$25,00
Remaining	

New Machine	
Purchase price	$100,000
Variable manufacturing costs per year	$ 36,000
Useful life	5 years

Keep or Replace Analysis	Keep	Replace	Income Increase (Decrease)
Revenues			
Sale of existing machine		$ 25,000	
Costs			
Purchase of new machine		(100,000)	
Variable manufacturing costs	$(250,000)†	(180,000)‡	
Income (loss)	$(250,000)	$(255,000)	$(5,000)

†$50,000 × 5 years ‡$36,000 × 5 years

Exhibit 25.11

Decision rule: Keep the current machine

Learning Objective P5: Evaluate keep or replace decisions.

© McGraw-Hill Education

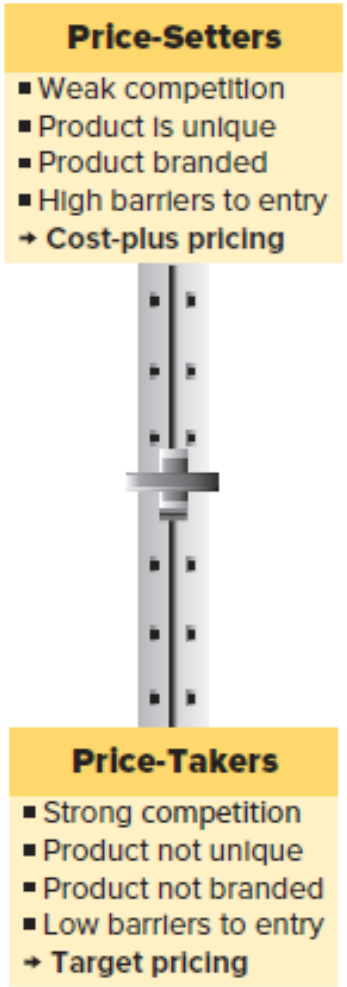
Access the text alternative for slide images.

Learning Objective P6

Determine product selling price.

© McGraw-Hill Education

Normal Pricing



Companies can be a price taker or a price setter (or somewhere in between).

Price takers have less control over setting prices.

Price setters have more control over setting prices.

Price takers use more target pricing type methods.

Price setters use more cost-plus pricing.

Learning Objective P6: Determine product selling price.

© McGraw-Hill Education

Access the text alternative for slide images.

Cost-Plus Methods

- Cost-plus pricing methods common when companies are price-setters.
- Management adds a markup to cost to get selling price.

❶ Determine total cost per unit.

Total costs = Product costs + Selling, general, and administrative costs

Total cost per unit = Total costs ÷ Total units expected to be produced and sold

❷ Determine dollar markup per unit.

Markup per unit = Total cost per unit × Markup percentage

❸ Determine selling price per unit.

Selling price per unit = Total cost per unit + Markup per unit

Learning Objective P6: Determine product selling price.

© McGraw-Hill Education

Access the text alternative for slide images.

Total Cost Method

Applying the three-step process to determine price

Variable costs (per unit)		Fixed costs (total)	
Direct materials	$20	Overhead	$140,000
Direct labor	16	Selling, general, and administrative	60,000
Overhead	8		
[illegible]	6		

1

Product costs		
Direct materials ($20 × 10,000)	$200,000	
Direct labor ($16 × 10,000)	160,000	
Variable overhead ($8 × 10,000)	80,000	
Fixed overhead	140,000	$580,000
Selling, general and administrative costs		
Variable ($6 × 10,000)	60,000	
Fixed	60,000	120,000
Total costs		$700,000
Units to be produced and sold		÷ 10,000
Total cost per unit		**$ 70**

2

Total cost per unit	$ 70
Markup percentage	× 20%
Markup per unit	**$ 14**

3

Total cost per unit	$70
Markup per unit	14
Selling price per unit	**$84**

Learning Objective P6: Determine product selling price.

© McGraw-Hill Education

Access the text alternative for slide images.

Target Costing Method

Target costing can be used when competition is high.

- Expected selling price is $80.
- Company wants profit of $14 per unit.
- Company must reduce target cost per unit to $66 ($80 price - $14 target profit).

$$\text{Target cost} = \text{Expected selling price} - \text{Target profit}$$

Learning Objective P6: Determine product selling price.

© McGraw-Hill Education

Variable Cost Method

① Determine markup percentage.

$$\text{Markup percentage} = \frac{\text{Target profit} + \text{Total fixed costs}}{\text{Total variable cost}}$$

② Determine dollar markup per unit.

$$\text{Markup per unit} = \text{Variable cost per unit} \times \text{Markup percentage}$$

③ Determine selling price per unit.

$$\text{Selling price per unit} = \text{Variable cost per unit} + \text{Markup per unit}$$

①

Target profit	$140,000
Fixed costs	
Overhead	140,000
Selling, general, and administrative	60,000
Target profit + Total fixed costs	$340,000
Variable cost per unit ($20 + $16 + $8 + $6)	$ 50
Units to produce and sell	× 10,000
Total variable cost	$500,000
Markup percentage ($340,000/$500,000)	68%

②

Variable cost per unit	$ 50
Markup percentage	×68%
Markup per unit	$ 34

③

Variable cost per unit	$ 50
Markup per unit	34
Selling price per unit	$84

Learning Objective P6: Determine product selling price.

© McGraw-Hill Education

Access the text alternative for slide images.

Learning Objective P7

Evaluate special offer decisions.

© McGraw-Hill Education

Special Pricing

Companies sometimes receive special offers at prices lower than normal selling price.

The decision to accept special offers should be based their income effects.

Decision rule: Accept the special offer if income increases (and re

Contribution Margin Income Statement		
For Year Ended December 31	**Per Unit**	**Total**
Sales (100,000 units)	$10.00	$1,000,000
Variable costs		
Direct materials	3.50	350,000
Direct labor	2.20	220,000
Variable overhead	0.90	90,000
Contribution margin	3.40	340,000
Fixed costs		
Fixed overhead	0.60	60,000
Fixed general and administrative	0.80	80,000
Income	$ 2.00	$ 200,000

Exhibit 25.12

Learning Objective P7: Evaluate special offer decisions.

© McGraw-Hill Education

Special Pricing Analysis

Decision: FasTrac should accept the offer to earn additional income of $18,000.

Special Offer Analysis	Per Unit	Total
Sales (10,000 units)	$ 8.50	$ 85,000
Variable costs		
Direct materials	3.50	35,000
Direct labor	2.20	22,000
Variable overhead	0.90	9,000
Contribution margin	1.90	19,000
Fixed costs		
Fixed overhead	—	—
Fixed general and administrative	0.10	1,000
Income	$1.80	$18,000

Exhibit 25.13

Learning Objective P7: Evaluate special offer decisions.

© McGraw-Hill Education

Learning Objective A1

Determine price of services using time and materials pricing.

© McGraw-Hill Education

Time and Materials Pricing

Time and materials pricing commonly used to price services.

Companies set a price for direct labor, direct materials, overhead, and a target profit.

Follows three steps:

1. Compute time charge (in $) per hour of direct labor. This rate includes a charge for non-materials overhead.
2. Compute the materials markup (%), which includes the overhead costs relating to buying, storing, and handling materials, plus a target profit margin on the materials' cost.
3. Estimate direct labor hours and cost, direct materials cost, and the markup to get price.

© McGraw-Hill Education

Time and Materials Pricing Analysis

Direct labor rate	$40 per DLH
Non-materials-related overhead	$10 per DLH
Materials-related overhead	3% of direct materials cost
Target profit margin (on both conversion and materials cost)	22%

Exhibit 25.14

1 Time charge per hour of direct labor

Direct labor rate per hour	$40
Non-materials-related overhead per hour	10
Total hourly conversion cost	50
Target profit ($50 × 22%)	11

2 Materials markup per dollar of materials cost

Materials-related overhead	3%
Target profit margin	22%
Materials markup	25%

3 Job is estimated to use 300 direct labor hours (DLH) and $14,000 of direct materials. Time and materials pricing yields a $35,800 price in Exhibit 25.14.

Time and Materials Price	
Direct labor (300 hours × $61 per DLH)	$18,300
Direct materials	14,000
Materials markup ($14,000 × 25%)	3,500
Time and materials price	$35,800

Learning Objective A1: Determine price of services using time and materials pricing.

© McGraw-Hill Education

End of Chapter 25

Copyright ©2021 McGraw-Hill Education. All rights reserved. No reproduction or distribution without the prior written consent of McGraw-Hill Education.